

Prostate Cancer

Where the prostate gland and what is its function?

The prostate is located directly beneath the bladder and in front of the rectum. Because the upper portion of the urethra passes through the prostate, if the gland becomes enlarged it can obstruct the passage of urine or semen through the urethra. The prostate is a walnut-sized gland that surrounds the urethra, the tube that transports urine and sperm out of the body. The main function of the prostate is to produce semen, the milky fluid that transports sperm. Sperm is produced in the testicles, which also produce the main male hormone testosterone.

What is prostate cancer?

Prostate cancer is a malignant tumor that usually begins in the outer part of the prostate. In most men, the cancer grows very slowly. In fact, many men with the disease will never know they had the condition. Early prostate cancer is confined to the prostate gland itself, and the majority of patients with this type of cancer can live for years with no problems.

What causes prostate cancer?

Like many cancers, the cause of prostate cancer is unknown. But doctors do know that it is more common in African-American men and men with a family history of the disease. The male sex hormone testosterone also contributes to its growth.

What are the symptoms of prostate cancer?

Prostate cancer, by nature, is silent in its initial stages. Its symptoms don't appear until later, when patients may notice a need to urinate frequently, particularly at night. Prostate cancer may also cause a difficulty or inability to urinate, a weak or interrupted flow of urine or painful and burning urination. Other symptoms may include painful ejaculation, blood in urine or semen, and frequent pain or stiffness in the lower back, hips or extremities.

The following are some of the risk factors for prostate cancer:

- **Age.** The greatest risk factor for prostate cancer is age. More than 75 percent of all prostate cancers are diagnosed in men older than 65 years.
- **Family history.** Men whose relatives have had prostate cancer are considered to be at high risk. Having a father or brother with the disease doubles your risk for prostate cancer, according to the American Cancer Society. Therefore, screening for prostate cancer should be started at age 40 in men with a family history of the disease.

To date, two genes have been identified that predispose a man to prostate cancer. Experts estimate that the hereditary form of prostate cancer accounts for just 9 percent of all cases.

- **Race.** African-Americans have the highest incidence of prostate cancer.
- **Diet.** The disease is much more common in countries in which meat and dairy products are dietary staples, compared with countries in which the basic diet consists of rice, soybean products, and vegetables. High dietary fat may be a contributing factor
- **Male hormones.** High levels of male hormones called androgens may increase the risk of prostate cancer for some men, according to the American Cancer Society. Research is currently under way to determine whether medicines that lower androgen levels can lower the risk of prostate cancer.
- **Sedentary lifestyle.** You may be able to reduce your risk for prostate cancer by getting regular exercise and maintaining your optimal weight.

How is prostate cancer detected?

The most effective means of detecting prostate cancer early is through a screening, which involves a digital rectal exam and measuring the amount of prostate-specific antigen (PSA) in the blood.

The PSA test is believed to detect most prostate cancers. PSA is a protein secreted by the prostate into the bloodstream. Elevated levels of this antigen may indicate the presence of prostate cancer.

If cancer is suspected, a prostate biopsy (removal of tiny pieces of prostate tissue) will be performed. By removing a tissue sample from the tumor and examining it, doctors can confirm or rule out a diagnosis of cancer and determine whether the disease has spread to other organs.

What if prostate cancer is diagnosed?

Fortunately, most prostate cancers have not spread at the time they are diagnosed, and the cancer is most often confined to the prostate gland.

To help predict the aggressiveness of the prostate cancer, your physician will look at your PSA levels before the biopsy and will also calculate the "Gleason Score."

From the PSA levels and the Gleason Score, a treatment plan is devised. For men with a low risk of the cancer having spread outside the gland, staging studies such as bone scans and computed tomography scans are not needed. Men with cancer with a higher likelihood of spreading may require these staging studies to determine where the cancer may have spread.

What are the treatment options for prostate cancer?

Physicians tailor prostate cancer treatment plans to their patient's needs, taking into account the type of cancer, the age of the individual, the degree to which the cancer has spread and the general health of the patient.

- **Observation or surveillance.** For men with low-risk cancer, observation may be an initial strategy.

Surgery to remove prostate gland:

Complete removal of the prostate is one of the most common treatments for prostate cancer.

- **Open radical prostatectomy** :The open radical prostatectomy procedure is performed through a 5 to 8 inch incision (cut) between the umbilicus and the pubic bone.
- **Laparoscopic radical prostatectomy.** A minimally invasive procedure, laparoscopic prostatectomy removes the prostate gland. Laparoscopic prostatectomy is offered at only a handful of medical centers in the country. Unlike conventional surgery, a laparoscopic prostatectomy requires only five button-hole incisions. Through these incisions, a surgeon uses a laparoscope—a tiny camera—and surgical instruments to conduct the operation and remove the prostate. The robotic-assisted laparoscopic radical prostatectomy involves inserting surgical instruments and a video camera through 5 to 6 small (0.5-inch) incisions in the abdomen; these are attached to a robotic that the surgeon controls using a video console. A small (3-inch) incision is made to remove the prostate specimen at the end of the robotic procedure. Robotic prostatectomy is gaining popularity due to the appeal of smaller incisions and less blood loss. However, there do not appear to be substantial differences between the open and robotic procedures in the most important outcomes: cancer control, complications, urinary continence, and sexual function. The technical skill of the surgeon appears to be a major determinant of a successful outcome.
- **Risks:** There are chances to lose control of their ability to urinate after surgery, and the problem could last for months. While most men gradually improve, about 10 percent will leak urine after coughing or other stressors. One percent or less will have a more severe long-term problem that can be fixed by the placement of an artificial sphincter. Impotence may range from 20 to 70 percent – with this range being complicated by the number of men with possible pre-existing sexual dysfunction and the reported stage of cancer.
- **Benefits:** Prostate cancer surgery often provides peace of mind because it removes the cancer. Men whose cancer has not spread beyond the prostate

have a 90 percent chance of surviving and being cancer-free 10 years after surgery.

- **Radiation therapy.** Radiation therapy uses high energy x-rays to kill cancer cells and shrink tumors. Radiation can be produced from a machine outside the body (external radiation) or by putting materials that produce radiation (radioisotopes) through thin plastic tubes into the area in which the cancer cells are found (internal radiation).
- **Interstitial brachytherapy (seed implantation).** Interstitial brachytherapy is a form of radiation therapy. A radiation oncologist and urologist implant radioactive pellets or "seeds" into the prostate, and the pellets radiate the prostate and surrounding tissue over time.
- **Intensity-modulated radiotherapy.** An advanced form of radiotherapy called intensity-modulated radiotherapy has shortened the duration of prostate cancer treatment by several weeks. With computer guidance, high doses of radiotherapy can be delivered precisely to the tumor, reducing the risk to normal tissue.
- **Cryotherapy.** Small needle-shaped probes can be inserted into the prostate to freeze the gland to temperatures lethal to a prostate cancer. This minimally invasive, incision-free procedure is performed either on an outpatient basis or with a one-night hospital admission. Patients recover in a matter of days and usually experience minimal after effects.
- **Hormone therapy.** Hormone therapy is a prostate cancer treatment that alters the body's hormone balance to prevent certain cancers from growing. Hormone therapy may be accomplished using drugs that alter the way hormones work or with surgery that removes hormone-producing organs such as the testes.
- **Chemotherapy.** Chemotherapy involves the use of drugs to kill cancer cells. Chemotherapy may be taken orally or injected into a vein. Chemotherapy is usually a systemic treatment, which means that the drugs enter the bloodstream, travel through the body, and can kill cancer cells anywhere in the body, including the prostate.